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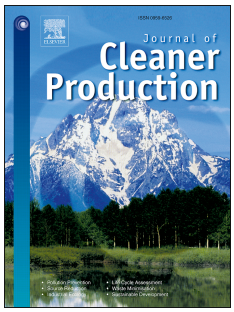

Changes in CO_2 emissions from China's energy-intensive industries: A subsystem input-output decomposition analysis

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Changes in CO_2 emissions from China's energy-intensive industries: A subsystem input-output decomposition analysis

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Abstract

This paper presents a subsystem input-output model to analyse the patterns behind the evolution of CO_2 emissions in energy-intensive industries. Two emissions accounting principles (the production accounting principle and the consumption accounting principle) are applied. The embodied CO_2 emissions are divided into the production-based CO_2 emissions associated with three components (internal component (IC), external component (EC) and demand level component (DLC)) in addition to the CO_2 emissions identified by the indirect component (INC) from a consumption perspective. A structural decomposition analysis is further conducted to decompose the emissions changes into 3 effects, which are the emissions intensity effect (ET), the technological effect (TT) and the demand effect (DT). The results show that the external component is primarily responsible for increased CO_2 emissions and the demand effect is the key factor in the decrease of CO_2 emissions. Moreover, sectors with a positive difference between production-based and consumption-based emissions are more sensitive than the others to the technological changes. Thus, different measures should be adopted by considering sectorial realities.

Keyword: CO_2 emissions; Energy-intensive industry; Subsystem input-output model; Structural decomposition analysis

Highlights

- The patterns behind the evolution of CO_2 emissions in China's energy-intensive industries are analysed from both production and consumption perspectives.
- A subsystem input-output decomposition analysis is employed to explore the factors behind CO_2 emissions changes in China's energy-intensive industries.
- The pulling effect of non-energy intensive industries on the CO_2 emissions in energy-intensive industries is discussed.
- The policy implications of the results from China's energy-intensive industries are analysed.